Hobbies WEEKLY

Design Patterns and full instructions for a LOW-WING FLYING MONOPLANE

June 13th. 1936

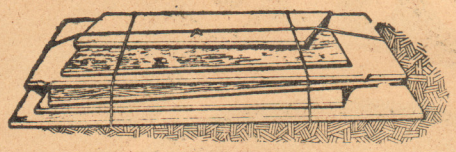
2D

Vol. 82. No. 2121

THE FRETWORKER'S AND HOME CRAFTSMAN'S JOURNAL

SAVE MONEY

on these bargain parcels of wood



The handyman is always wanting fretwood for various purposes. The parcels shown are special cut lines of good quality boards, planed both sides and ready for use. Not a bit of waste among them. Every woodworker should have a stock by him to serve the odd jobs he is constantly undertaking.

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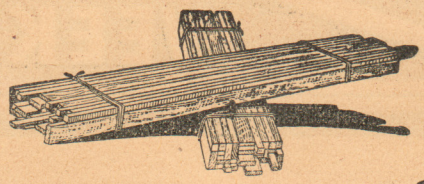

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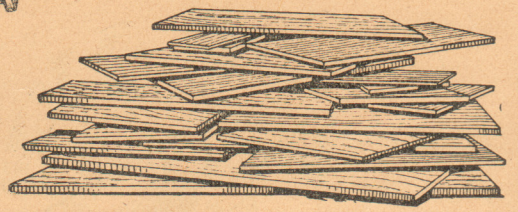

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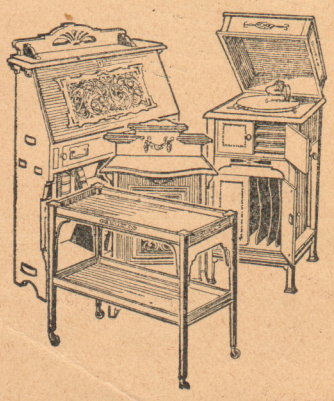
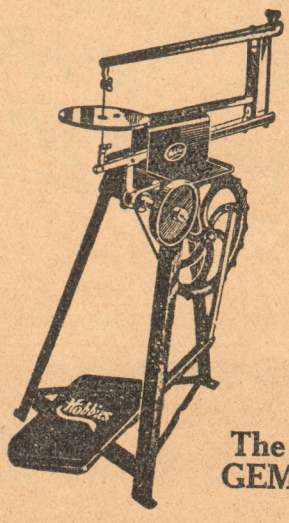


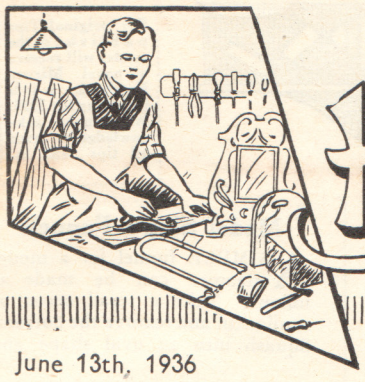
Free list of fuller details on request.

You can try one for yourself at the Hobbies Branches in London, Glasgow, Manchester, Birmingham, Leeds, Sheffield, Southampton, Brighton. Or further particulars from the makers—Hobbies Limited, Dereham, Norfolk.

A Factory at home!



The GEM



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The Editor's Notes

THIS is the age of flying and more and more people are taking an interest in the most modern method of getting about. There is something peculiarly fascinating in an endeavour to make a machine which is heavier than air, float and fly to our own will and direction. There is a definite science behind all this, and more enthusiasts are working out the principles and putting the theory into practice by means of models. You cannot put two pieces of wood together, add a propeller and piece of elastic and make it fly. The peculiarities of aerodynamics, lift, gravity, thrust, drag, etc., must all be understood, before a practical flying model can be made.

SO you see what it means to publish an article on a real model plane—one which anyone can make with a little care and patience and which will rise in the air and fly correctly. We have had a number of tests carried out by an expert before we were satisfied to offer you the excellent low-wing monoplane which is the subject of this week's gift sheet. It is no tiny model, but, as can be seen by the pictures, a full size plane which has been actually flying. Naturally such a model costs money, but we have arranged complete kits of parts where everything necessary is supplied, almost ready to put together.

IN addition to that we are offering to answer any question or put right any reader who happens to have difficulty through ignorance or inexperience. So you, and anyone else, can commence right away in confidence, knowing you have a sound practical design, reliable materials to work with, and the benefit of expert advice on any trouble which may arise. Now go right ahead, and let me hear of your duration flights in due course.

READERS who follow our Stamp Collecting Page will have noticed the absence of their favourite articles the last week or two. I am sorry to say the Stamp Expert who usually supplies this information has been ill, but now that he is well on the way to recovery I hope to re-commence the regular appearance again shortly. I do not promise they shall appear every week, because there are so many other pastimes in the summer that we do not feel like spending so much time over our stamp books just now.

PERSONALLY I think two years is too long to take over the completion of a model because one is apt to get tired of the job unless you have endless patience. That cannot be the opinion of everyone, however, because I find that at a recent Exhibition run by the Art and Craft Club of Leyland Motors at Chorley, Lancs., one of the entries was a fire engine, complete with extending ladders, which had taken more than that period to make. That, however, is better than being in *too* much hurry, as was seen in the same exhibition where a miniature baby grand model had the bass notes at the top of the piano, because the maker had not the time to alter them when he found them wrong!

THE enthusiasm of some workers surely knows no bounds! I am told of a worker in Rhodesia the other day who sent a cable asking Hobbies to forward him ten 1ft. lengths of a certain moulding. He was certainly in an enormous hurry to cable.

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Next Week's Design—Wheelbarrow Pincushion

Correspondence should be addressed to: The Editor, Hobbies Weekly, Dereham, Norfolk, and a stamp enclosed with the Reply Coupon from Cover iii if a reply is required. Particulars of Subscription rates, Publishing, Advertising, etc. will be found on cover iii.

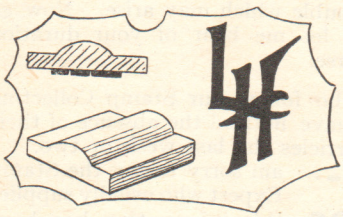
Send your own simple tips to The Editor, Hobbies Weekly, Dereham, Norfolk. Keep them short and add rough pencil sketches if possible.

HINTS AND TIPS WORTH KNOWING

For original Tips published the sender will receive a novel Mirror Notebook with Calendar for 1936. We cannot acknowledge or print all tips sent in.

League Stamp

THIS can be made of two pieces of wood one of which is 3 ply, the other being a small block of wood shaped to form a handle. Then cut out the shape with a fretsaw on the plywood and



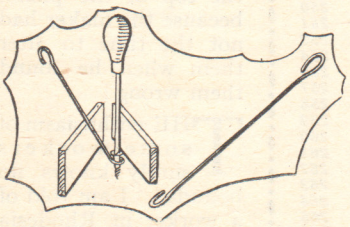
smooth up. Glue this to handle, keeping face so the lettering is reversed when glued on. Thus when the stamp is used on an ordinary ink pad it comes out the right way.

Filing Fretmachine

WHEN you are ready to file your work which you have cut, take whatever fretwork file is suitable for the work you are at, and place in the jaws of the fretmachine the same as you would a fretsaw, you can file the outline of the work first. Then you can thread the file into the holes the same as fretcutting. This method files much better than the hand.

Awkward Screws

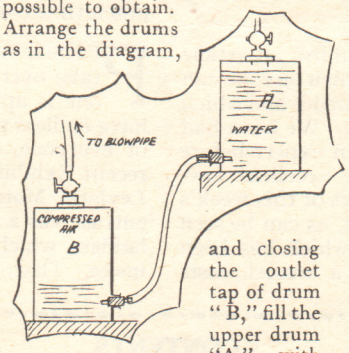
IF you have an awkward place in which to put a screw, and cannot hold the screw in the fingers, get a piece of reasonably



stiff wire and twist around the top of the screw. Then with the wire held in the left hand, the screw can be driven into place with the right hand, although some way off. The sketch helps to illustrate the point quite clearly.

Compressed Air Supply

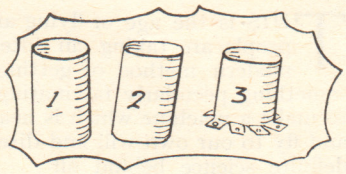
A USEFUL supply of compressed air may be arranged by procuring two ten gallon drums from a local garage, these as a rule being non-returnable, and therefore cheap. In the top of each, solder a tap. Any tap procurable will do. The local plumber usually has several which are unsuitable for his needs. Remove the screw-plug from the bottom of each and replace by a cork, preferably wired in, through which pass a piece of ¾in. pipe in each case. The two bottom pipes are now connected by a piece of flexible pipe. Garden-hose is quite convenient. The longer the hose, the greater the pressure it is possible to obtain. Arrange the drums as in the diagram,



and closing the outlet tap of drum "B," fill the upper drum "A," with water. Air will be compressed in the lower drum, when the upper tap is opened the pressure depending on the difference in heights. The pressure is increased by raising the upper drum. Connect the outlet tap of the lower drum to the blowpipe, small forge, or whatever else it is required to run, and control the air supply by this means. When the lower drum is empty, the positions of the two drums is reversed. Small paint-sprays for model work may be run by this means. Similarly, by starting with the lower drum full of water and then raising it a few inches above the other, and allowing it to fill with coal-gas, the gas may be compressed and used for filling balloons.

Model Ship's Funnels

A SIMPLE funnel for a model steamer can be made as follows. Take a small cocoa or similar tin and remove the bottom. Squash into an oval shape and



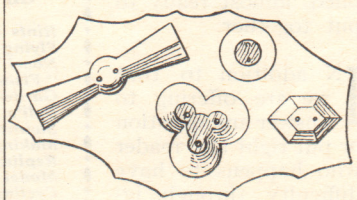
bend slightly out of upright. Cut the sides as shown, with one or two lugs at the bottom to provide a flange cut, bend over and tack to the deck.

Cleaning Metal Rulers

TO clean metal rulers which have become rusty, do not rub them with emery paper, as this removes the markings, but instead rub them with a cloth soaked in paraffin.

Wooden Button Making

WOODEN buttons are very fashionable as a glance in the drapers' or fashion papers will show. Possibly the fashion will soon be over, so you must "strike while the iron is hot." First procure some wood about ⅜in. or ¼in. thick. Plane the wood and then choose a design, after the type illustrated here. Draw about a dozen of one type and cut out



with a fretsaw, then round it off with chisel, file and glasspaper. Varnish but do not paint them. Get a piece of white cardboard and stitch the dozen on. Then you can use them as presents or sell them among your friends. When you become an expert, make several and try to sell them to the drapers.

A FLYING MODEL LOW-WING MONOPLANE

Specially designed and produced for Hobbies. Has been tested and proved good. With wing span of 3ft. 10ins. and a 14in. air screw

THIS low-wing monoplane provides more realism than the average model, and is a change from the usual type of square section fuselage with its mainplane clapped on to the bottom instead of the top. There is nothing in its construction that the worker cannot tackle with the usual fretwork tools, a pair of wire-cutting pliers, and a soldering bit.

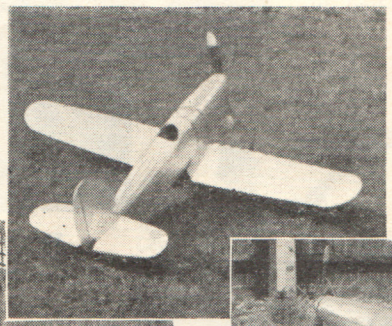
Fuselage

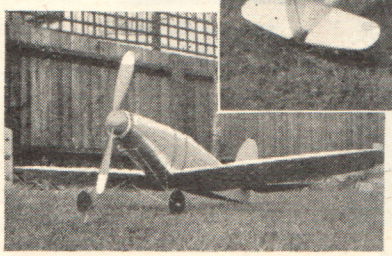
The four longerons are of $\frac{1}{8}$in. by $\frac{1}{8}$in. birch, and the formers of 1/16in. 3-ply, except the nose former, which is 3/16in. 3-ply. Stringers of $\frac{1}{8}$in. by 1/16in. and 1/16in by 1/16in. birch are used to maintain the shape between formers, and the front of the fuselage is covered with a skin of 1/32in. sheet balsa from nose to back of cockpit.

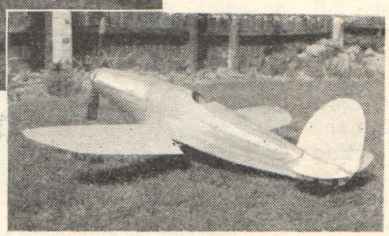
The latter is of 1 mm. 3-ply, and pieces of this are used at the top and bottom of the last bay to give rigidity. The sternpost is of $\frac{1}{4}$in. by $\frac{1}{8}$in. birch, to either side of which is cemented a strip of 3/16in. by $\frac{1}{8}$in. spruce, leaving just over $\frac{1}{8}$in. space top and bottom for the longerons.

Commence by taking the two top longerons, 30$\frac{3}{4}$ins. long, which allows for a little overhang at the ends, afterwards sliced off neatly with a razor blade.

Place them side by side, and mark very carefully the positions of the formers at intervals shewn on the drawing. Steam inwards to a curve between formers Nos. 1 to 4 and 7 and 8. Cut the two pieces of 1 mm. 3-ply for the last bay, and, taking the top piece, glue it to the longerons at the rear end, using Durofix.







Repeat the process with the bottom longerons, which end at No. 4 former.

It has only been possible in the limited space to show half of each former. Taking a piece of greaseproof paper such as is used in the kitchen, trace the centre line and half outline of each, turn the paper over, and complete the outline.

Place a piece of pencil carbon paper on to the 3-ply and with a sharp hard pencil, draw the shape of each former through on to the wood. Note the direction of grain. When cutting away the inside of No. 1 former, cut out the rectangular piece indicated, and put it by for use later.

After cleaning up the formers with No. 1 glass-paper, cement a piece of $\frac{1}{8}$in. square birch across Nos. 2 and 4 where shewn, and immediately under these strips, glue and bind a length of brass tube to take 16 gauge wire undercarriage legs.

To assemble the fuselage, cement Nos. 4, 5, 6 and 7 formers into place between the longerons, making sure that they are dead square both horizontally and vertically.

Holding the Parts

Thin rubber bands stretched right round the longerons will hold the job together while drying. When this portion is quite dry and rigid, cement No. 1 former into place, also dead square, and then the sternpost attachment. Aim at keeping the top longerons perfectly straight by sighting down them occasionally.

The remaining formers are then slipped into position, and the stringers cemented into the slots provided. Cut these a little longer than necessary and slice the ends flush with a razor blade when dry.

The cockpit, of 1 mm. 3-ply, is damped on the top side to help the curve while drying. Because the curved top to No. 7 former is shorter than No. 6, a small piece will have to be cut away from the rear end in the centre, and the ends butted together. Rubber bands stretched around the formers after gluing will make a tight joint. Add the diagonal brace of $\frac{1}{8}$in. square birch to the right hand side of the last bay only, as the rubber motor is slipped in from the left.

Cover the front of the fuselage with 1/32in.

sheet balsa in strips, so that the edges butt together down the centres of the stringers.

Starting from the straight top stringer, work downwards each side, and cut each piece to shape neatly with a razor blade. Where a strip has to curve slightly in both directions, cut from the sides, where the formers are, very acute angled notches, not more than 1/16in. wide and about ½in. deep. Damp the upper side of the strips and they will curve naturally while the glue is drying.

Fuselage Cover

After a clean up with glasspaper, the fuselage is covered with fine jap silk. Cut into strips the way of the selvedge and fix in place with photo mounting paste.

First cover completely as far back as No. 6 former, keeping the silk damp meanwhile and stretching out all wrinkles as the work proceeds. A scent spray filled with water used occasionally is very useful.

Next cover the top from No. 6 to No. 10 former, after smearing paste along the top longerons and around the edge of the cockpit. Slice away the overhanging edges with a razor blade, and cover the remainder of the sides and bottom.

Always work on the principle of having one edge stuck sufficiently to resist the pulling out of wrinkles. The left hand side is not covered between No. 10 former and sternpost. When quite dry, give with a soft brush two coats of dope at intervals of a couple of hours in a warm room, brushing the dope well into the fabric.

The whole model may be finished in aluminium dope subsequently. The cockpit is lined with valve rubber, slit down its length and cemented with Durofix.

Mainplane

Cut two of each rib in 1/16in. 3-ply, all shewn full size. Fret away the insides of all except the centre section ribs, as shewn in No. 1 rib. Cut the two centre section stiffeners, which also give the correct dihedral to the main spars, glued between them.

Launching the Monoplone by hand

The top main spar is steamed slightly backwards and downwards at rib No. 1, and to a curve from Rib No. 12.

Before threading ribs at 3in. intervals between spars, make sure that the tips of the bottom spars are raised equal distances from a continuation of the bottom line of the stiffeners.

Place the assembly on a table with the ribs of one side cemented at the spars and slip the trailing edge into position, gluing and weighting down the rear ends of the ribs on to this until dry.

Square Ribs

See that all ribs are square with trailing edge. Repeat with the other side. The leading edge is steamed upwards at the front of the centre section ribs and backwards at No. 1 rib. If only 3 foot lengths are used, a joint may be made in the middle of the centre section, glued and bound. Glue the leading edge into position, also the centre section trailing edge, which is steamed upwards from the inner ribs.

The diagonal part of the trailing edge is cut from 1/16in. 3-ply. Note the joint with the rest of the trailing edge at No. 1 Rib, where it is glued and bound. A gusset of 1 mm. 3-ply is cemented where shewn.

The wing tips are 18 gauge wire, bound at the ends and at the point where they meet the main spars.

The riblets are inserted last, being cut to size from 1/16in. sheet balsa with the necessary slots, carved to follow the shape of the other ribs. Thin wire hooks are bound to the leading edge and top spars where shewn, the wing being held to the fuselage by rubber bands slipped under these.

Showing the good proportions of the model

After papering smooth, the wing is covered with damped silk in five pieces—first the bottom, each side from tip to centre section, then the centre section underneath, and finally, the top surface from tip to centre section ribs.

Smear a little glue along No. 12 rib and the spar from here to tip, and lap the edges over wire tip with photo paste. When fairly dry, re-damp silk and stick to inside edge of centre section rib, stretching gently and evenly until fairly taut. Keep the threads of silk as straight as possible. Then lap over trailing edge, using photo paste, and snipping nicks with scissors at ribs. Finish by lapping over leading edge in same way.

Keep each half flat under weights while drying to prevent warping. The wing is given two coats of dope at intervals when quite dry.

Tail Unit

The frame of tail plane is 16 gauge wire in one

piece, the ends forming projections which push into holes in No. 10 former. The ribs and centre portion, which is also in one piece, are 18 gauge wire, bound with florist's wire or fuse wire and soldered where shewn.

It will be noticed that a straight tail of wire is left at the rear end, which is bent down at right angles and pushed through the hole in a small terminal screwed into the sternpost, for adjustment.

The ribs and centre portion are bent upwards to form a slight camber—about ⅛in.—one third of their length back from leading edge. To leading and trailing edges of frame, bind and solder two pieces of brass tubing, ½in. long, in such a position that the inner ends are slightly outside the centre line, to ensure that the fin is straight.

The rudder is entirely of 18 gauge wire, the frame again being in one piece with a vertical spar bound and soldered between the ends. Another right angled piece is bound and soldered to the bottom near the front.

This is bent to the left, and the other projection to the right. When these are slipped into the brass tubes on the tail, the fin will be held vertically and rigidly.

Covering

The tail unit is covered with silk and one coat of dope only brushed on. The simplest way to cover it is to make a rectangular frame of, say, ½in. square stripwood, about two inches larger each way than the wire frame.

Cut a rectangle of silk and stick to edges of wood frame. Tack this down to a wooden board so that the silk, after damping, is stretched taut.

Then glue the outline of the wire frame liberally but evenly—seccotine is best here—and place it upside down on the silk. When dry, snip away with scissors leaving a margin of silk about 3/16in. wide, and lap the edges over.

(*To be continued*)

MATERIAL REQUIRED

SPECIAL FITTINGS

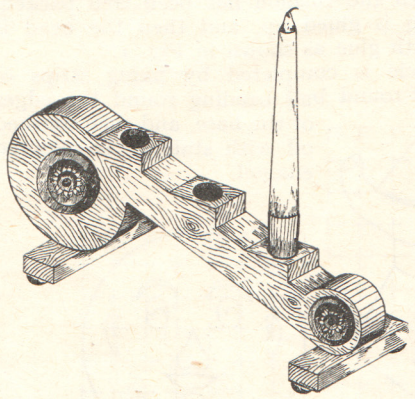
1 airscrew, 14ins. diam., 18ins. pitch.
3 brass gears, 11/16in. 2 drilled 16 gauge. 1 drilled 14 gauge.
1 plain hooked airscrew shaft 14 gauge.
2 plain hooked airscrew shaft 16 gauge.
4 cup washers, 16 gauge.
2 Cup washers, 14 gauge.
2 brass push-in nose bushes, 16 gauge.
1 brass push-in nose bush, 14 gauge.
2 brass screwed wheel bushes, 16 gauge.
1 6in. length brass tube, 16 gauge.
1 3in. length brass tube, 18 gauge.
2 6ft. coils 16 s.w.g. piano wire.
1 12ft. coil 18 s.w.g. piano wire.
1 reel plated binding wire.
1 12in. length valve tubing.
1 small terminal.
1½yds. 36in. wide Jap silk.
20yds. ¼in. by 1/20in. flat strip rubber.
1 small tube of "Durofix."

WOOD

8 ⅛in. by ⅛in. by 3ft. birch.
2 1/16in. by 1/16in. by 3ft. birch.
1 ¼in. by ⅛in. by 3in. birch.
7 ⅛in. by 1/16in. by 3ft. birch.
2 ⅜in. by 1/16in. by 3ft. birch.
2 3/16in. by ⅛in. by 3ft. spruce.
3 18in. by 6in. by 1/16in. birch 3-ply.
1 7½in. by 9in. by 1 mm. birch 3-ply.
1 4in. by 4in. piece 3/16in. birch 3-ply.
3 1/32in. by 3in. by 3ft. balsa sheet.
1 ¼in. by 2in. by 18in. balsa strip.
1 1/16in. by 2in. by 18in. balsa sheet.

A complete kit of parts, as mentioned above is supplied by Hobbies Ltd. for 19/6 or sent post free for 20/-

A NOVEL WOODEN CANDLE HOLDER



ARTISTIC candle holders are ever becoming more popular and the one illustrated, is designed to hold three candles. The holder should be cut from a piece of sound fancy wood quite free from any knots.

The wood, which is 1in. thick, is first made 12ins. long by 4ins. wide, and then the face is divided into 1in. squares as shown in Fig. 1. From this the outline is marked and cut out.

The three holes for the candles are made ⅞in. diameter and ⅞in. deep on the flat part of the design as shown in the detail. In the bottom of the holder at each end drill a ¼in. hole ¼in. deep as indicated, which are to receive the pegs for fixing the supports.

Two supports are required for the holder one at each end, and details of these are given in Fig. 2. The supports are made from wood ½in. thick and cut 3ins. long by 1in. wide. Drill a ¼in. hole in the centre, and glue a piece of ¼in. dowelling in this which stands out ¼in. as shown.

The supports are fixed into the holder with glue, and a small toe is glued on each corner to act as feet. A 2in. oak rosette is fixed on each side of the holder at the back, and a 1½in. rosette on each side at the front as shown in Fig. 1.

The article should be well smoothed and then finished off with a coat of stain and polish.

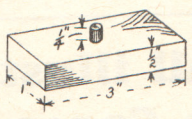


Fig. 2—The support

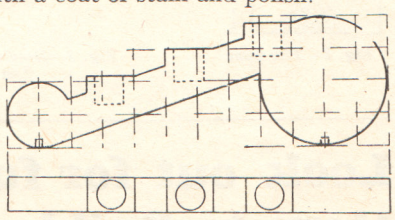


Fig. 1—Details of shape

THE "FISHERMAN" NOVELTY PINCUSHION

Fig. 1—The completed article

THE novel pin cushion illustrated in Fig. 1, is sure to please a lady friend for a present, and furthermore the article should find a ready market. There is plenty of work in the article for the fretsaw and the construction is quite simple.

The base is cut from wood ½in. thick and this is indicated in Fig. 2. Cut the wood 4ins. square and the mortise in the centre ½in. by ⅜in. as shown. On a centre line and a distance of 11/16in. from the edge cut another mortise ⅜in. by ¼in. as indicated.

The fish (indicated in Fig. 3) is cut from wood ⅜in. thick. First make the wood 4¼ins. long by 2¼ins. wide, and then divide the surface into ¼in. squares so it is a simple matter to mark off the fish from Fig. 3. Carefully cut the tenon on the bottom ½in. deep by ¼in. wide which should be a nice fit in the mortise cut in the base.

The Figure

We now come to the fisherman, and this is made in wood ⅜in. thick. Details of the body are given in Fig. 4. First cut the wood 5½ins. long by 3ins. wide, and divide the surface into ½in. squares, before drawing the figure from the details in Fig. 4. Then carefully cut it out. The tenon on the bottom is made ½in. deep by ½in. wide to fit into the mortise cut in the base. Carefully cut the slot in the top in the position given, ½in. deep by ⅜in. wide which is to take the fisherman's head.

The head is indicated in Fig. 5, and this also is made in wood ⅜in. thick. First cut the wood 4ins. long by 3½ins. wide, and carefully cut the tenon on the bottom in the centre ½in. deep by ⅜in. wide. Now scribe a circle 3½ins. diameter and then cut the head out carefully with the fretsaw. The eyes and markings on the face are done with coloured enamel, and the positions of these can be lightly marked in from the details in Fig. 5.

Assembly

Having cut the parts, commence to construct the article in the following manner. Fix the fish into the base with a little glue, and also glue the body of the fisherman into the base taking care to get the correct direction as clearly shown in Fig. 1.

Drill a ¼in. hole in the end of the fisherman's arm (Fig. 4) and glue in this a piece of ¼in. dowelling 1in. long to indicate a rod. A small hole is made in the end of the rod into which is fixed a length of wire. This wire which indicates the line is neatly bent into a curve, and is fixed into a small hole made in the fish.

The Pincushion

Before fixing on the head, the back is made into the form of a pincushion. First cut a piece of velvet and work this round the back of the head making secure with glue, and leaving a small opening into which is packed saw-dust or bran. When the cushion has been well packed, the opening is glued up, and then the head is fixed on with glue as shown in Fig. 1.

The article is completed by fixing strips of 3/16in. half-round ball beading round the edges of the base, and then finished off with stain or in coloured enamel.

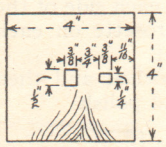


Fig. 2—The base

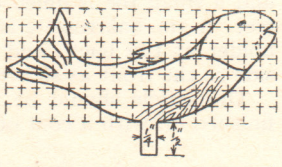


Fig. 3—How to mark out the fish shape

Fig. 4—The body of the figure

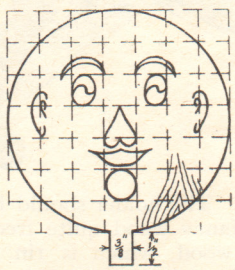
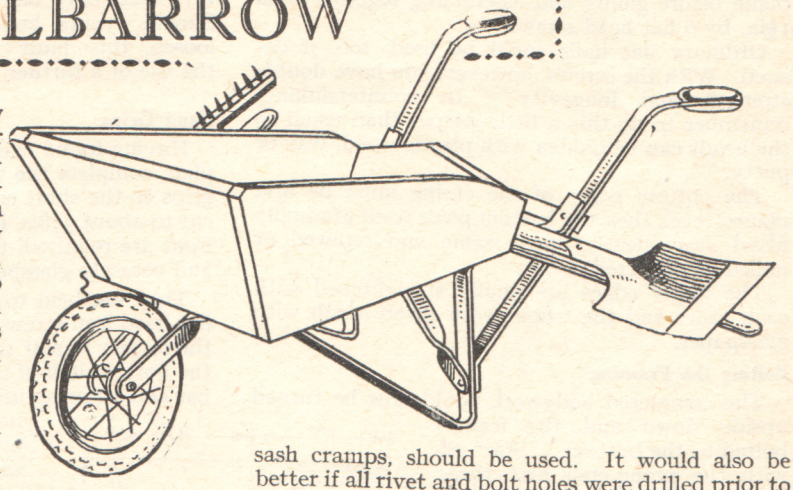


Fig. 5—How to cut out the head and face

Look out for full illustrated instructions on How to Build a Canoe in next week's issue

MAKING A GARDEN WHEELBARROW



AN ordinary wheelbarrow is, naturally, rather too heavy and cumbersome to be worth purchasing by the small garden enthusiast. What he really wants is something light, convenient and easy to handle—something he can obtain cheaply, keep in his own little shed and use when and where ever he likes. Agreed ?

Well, then, if *you* happen to be one of these busy fellows, here's the type of barrow that literally " suits you down to the ground ! "

You are also sure to appreciate the design, construction, and particularly the incorporation of a sponge-rubber tangent spoke wheel. This makes it possible for full loads to be trundled across lawns and concrete pathways without the usual apprehension of damaging same ; indeed it's quite a ladies' barrow !

The Steel Framework

Before contemplating the construction, nevertheless, it would be advisable to first obtain the 9in. sponge-rubber tangent spoke wheel and sufficient of the mild steel bar required. The latter can be purchased cheaply from most ironmongers, whilst the former can be had from any second-hand junk shop—or if preferred, bought new for about 1/3 or 2/6.

If you cannot get a wheel of the desired size, therefore, it will be easy to allow a little extra in the length of the frame forks when marking out a full-size side elevation as in Fig. 1.

This should be done on the reverse side of a sheet of old wallpaper with the aid of the small scale provided. Such a precaution will also give the exact lengths of the bars required and eliminate guesswork when bending each bar to shape.

Use Sash Cramps

A strong vice and an iron sash cramp, or two sash cramps, should be used. It would also be better if all rivet and bolt holes were drilled prior to bending. The rivets used could be the 3/16in. thick round or flat head variety, the last mentioned necessitating the holes to be countersunk in reverse to the other, i.e., of each framing part.

The thickness and length of the carriage bolt (acting as the wheel axle) will be determined according to the diameter of the central hole and size of the hub of the wheel obtained. As a small square shank is usually made at the head of such bolts, allow for same to be forced into one of the fork frames. This will prevent it from revolving with the wheel and enable the nut to be tightened.

The other carriage bolts holding the bodywork should be 1¼ins. long by ¼in. thick, their relative positions being seen in the elevation. Note the shape of the support riveted to the legs.

The holes are drilled in the latter 4ins. upwards from ground level. The size and shape of this support can be made more accurately when the parts are temporarily assembled.

The Bodywork

In making the body, we would suggest a hardwood such as oak, birch or beech, this being ¾in. thick throughout. Of course, softer material like American whitewood, chestnut, or even deal would serve. The latter is certainly much cheaper, but why not pay that little extra and thus ensure lasting service ?

Whatever your choice may be, a detail of the shape and dimensions of the ends and sides is provided at Figs. 2 and 3. The front and rear

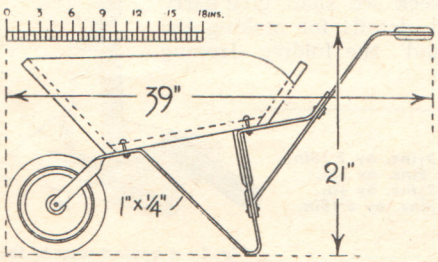


Fig. 1—A side elevation

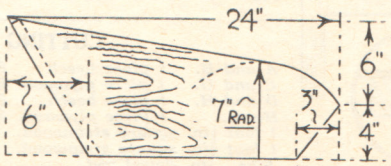


Fig. 2—Size and shape of the sides

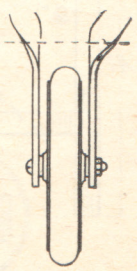


Fig. 4—The wheel assembly

end pieces are shown combined together and should be easily discerned. The sloping end edges of all four pieces should be straightened and trued with the plane before gluing and assembling together with 1½in. by 6 flat head screws.

Ordinary flat nails could be used, too, if desired. With the screws, however, you have double strength and longevity. In countersinking, remember to do this a little deeper than usual so the heads can be hidden with plastic wood, wax or putty.

The bottom edges of the casing must be first planed level, then the bottom piece itself gradually fitted *down* neatly inside same and screwed or nailed as preferred.

The upper edges are finally straightened with each other and the whole work given a rub with glasspaper.

Bolting the Framing

The completed bodywork could now be turned upside down and the frames bolted to the bottom. Start off with the prong ends first, these requiring to be bent in alignment with the wheel (see Fig. 4) irrespective of spreading out at the rear end.

When riveting the leg support and cross rail in position, ask a friend to hold one hammer against the head of the rivets whilst you flatten the projection with another. (No pun!)

Note in our drawing of the wheel fork assembly that only one nut is shown on the bolt. Should yours, however, have any tendency to loosen, this fault can be easily overcome by the use of a further " locking " nut.

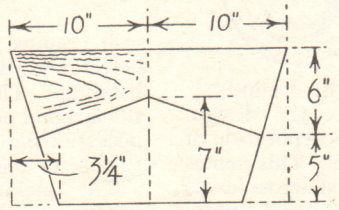


Fig. 3—The dimensions of the ends

Hand Grips

Having found everything bolted together as per plan, complete the work by fitting wooden handle grips to the shaft ends. These are pieces of wood cut to about 3½ins. long by 1in. wide by ½in. thick. Four are required, their edges being rounded over and coarsely glasspapered.

They are held to the shafts with two 1in. by 4 flat head iron screws, suitable holes being drilled in the former to suit same. This allows the screws of the bottom half of the grips to project through the bar and screw up into the top halves. Any unevenness should be removed with a file and both glasspapered smooth.

As an adequate finish, all the framework could be painted black, including the handle grips. The inside of the bodywork could be given an undercoat of brick red and the outside enamelled green.

Doll's Laundry—(*continued from opposite page*)

round to the outline. Clean up all the edges with glasspaper and then connect the two leaves together by the simple hinge shown in the enlarged detail at Fig. 4.

Two pieces of wide tape each about ¾in. long are first cut off, and one end glued to the face of one leaf of the horse. The piece is then carried round and the other end then glued to the reverse face of the second leaf.

The second hinge tape is similarly treated but the reverse way round for each end being made. By this means the two leaves are held together but they may be folded either way one upon the other.

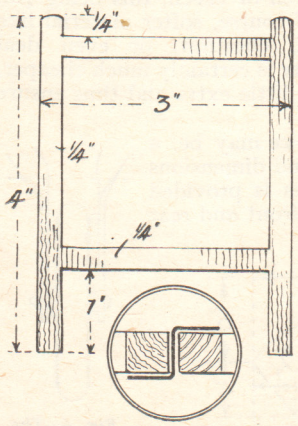


Fig. 4-Particulars of the "Horse"

The Clothes Post

Two lengths of ⅜in. square stripwood are cut off 6ins. long and one end of each shaped up to a point as in the detail Fig. 5. Two cross rope supports are fitted, ⅛in. holes being bored for the dowel rod J in Fig. 5.

Further down the posts a cross bar may be nailed on for use if the ropes are to be represented as being on pulleys. These cross-bars are shown at I and will be used for winding the ropes on.

For the base (H) use pieces of ¼in. stuff 2ins. by 1¼ins., and see that the widest portions of each are kept towards the pull of the linen line. It is a good plan to nail the two bases to a long strip of wood so as to hold the line rigid when the clothes are " hung out."

All the completed articles should be thoroughly papered clean and given a coat of clear varnish, bottles of which can be obtained from Hobbies, price 1/-.

Next week we shall give particulars and details for making the Mangle and the folding Ironing Board.

CUTTING LIST

A and B.	*1 piece beech*	*8ins. by 3½ins. by 3/16in.*
C and G.	*1 piece plywood.*	*6 ins. by 2ins. by ¼in.*
D and H.	*1 piece beech.*	*6ins. by 2½ins. by ¼in.*
Horse.	*1 piece plywood.*	*8ins. by 3ins. by 3/16in.*

1 foot ¼in. square stripwood.
1 foot ⅜in. square stripwood.
6ins., ⅛in. dowel rod.

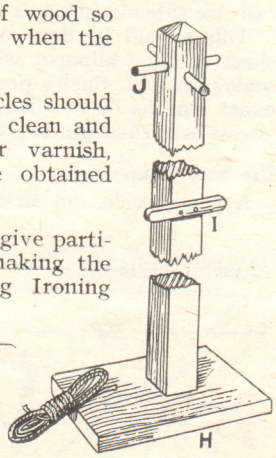
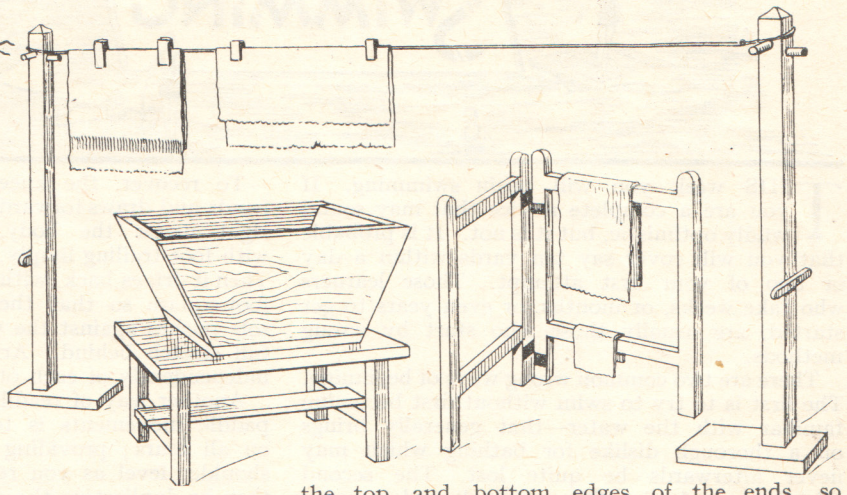


Fig. 5—A broken view of the clothes post

DOLL'S MODEL WASHING SET



THE little set of Doll's Laundry furniture shown here, together with that which we shall publish later, would make an ideal birthday gift for any tiny tot. All the pieces have been well thought out and assembled in the most simple manner possible. The necessary drafting out on to the wood will not be found difficult as all the parts shown are clearly figured and lettered.

All the cutting can be done with a 12in. fretsaw, and the only other tools required will be a small hammer, a pair of pliers, a screw driver, a bradawl and a sheet of fine and coarse glasspaper.

The articles included this week are a washing tub, with stool, a clothes horse and posts and cord for hanging out the linen.

The Washing Tub

There are five pieces of wood for this, the two sides and two end being of 3/16in. stuff and the bottom of ⅛in. wood. The measurements for the sides A are given in Fig. 1, and just a hint might be given here when drawing out this shape or similar ones where the sides are unequal or where they taper as in this case.

Take the 4in. length of wood and divide it into two and run a line down the centre. From this centre line set out 1 3/16in. each side and connect up these points with those above. Like this, the two side angles are bound to be correct. Mark out and cut round for one of the sides, then use this latter as a template for marking round and getting the true shape of the second side.

The Ends

The two ends B are 1⅞in. long by 1⅝ins. wide, and are cut with square angles and then glued between the sides. When the glue has thoroughly set hard lay a sheet of coarse glasspaper on a flat bench or table and proceed to rub down the top and bottom edges of the ends so that they lie flush with those of the sides.

On these sides and ends glue the bottom C which must measure 2⅜ins. by 2ins. Again, when the glue is hard, rub down the projecting ends of this piece on the glasspaper as before. Fig 2 shows how the pieces are assembled.

The Washing Stool

This again is a simple article to make and the parts in Fig. 3 show clearly how they are arranged. The top (D) is a plain oblong 4ins. by 2¼ins. by 3/16in. and to it is glued and pinned two sets of legs (E) having connecting rails (F).

The legs are 1¾ins. long and the rails 1¼ins. long, and all five pieces are cut from ¼in. by ¼in. stripwood. To hold the legs steady a cross board is added—(piece G) which is 4ins. long by ½in. by ⅛in. thick plywood. Long fret nails will be found best for fixing the legs and rails together and a couple of round-head screws for the board G to the rails, this being done of course before the top is nailed on.

The Clothes Horse

This two-fold piece is made from two pieces of 3/16in. plywood cut to the measurements given in Fig. 4. Draw one section out on the wood and cut it, then use this again as a template for the second leaf.

Take care in the cutting out with the fretsaw to do the interior large squares first before cutting

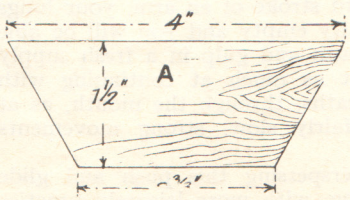


Fig. 1—The side of the Tub

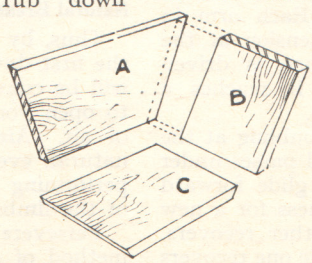


Fig. 2—Construction of the washing tub

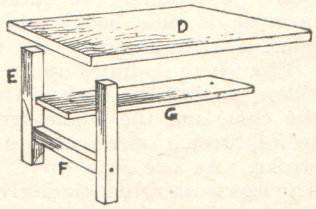
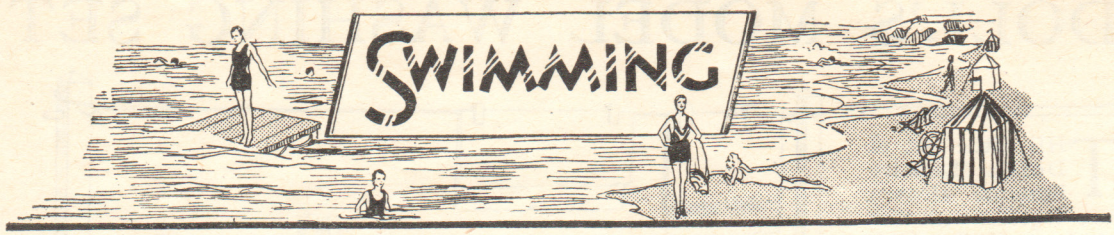


Fig. 3—How the stool is built



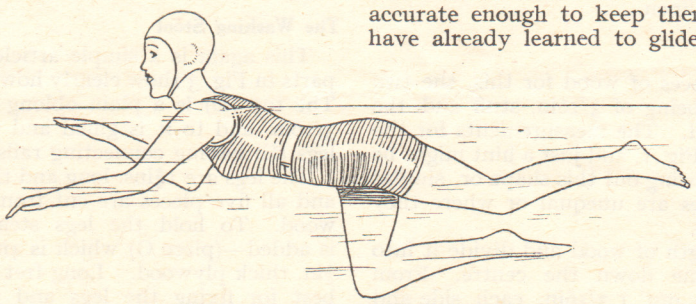
FIRST STROKES

THIS week you will begin swimming. If you are a complete novice that may sound wildly optimistic, but it is not. It is probable that you will cover say ten yards within a day or two of your first attempt. Those learners who take weeks, or months, or even years to get started, are usually those who start by wrong methods.

There are two common wrong ways of beginning. The first is to try to swim without first becoming familiar with the water—that generally brings on a thorough dislike for bathing which may never afterwards be quite lost. The second mistake is to begin with a difficult and complex stroke, like crawl or breast-stroke. These, to many people, are insuperably hard to learn, unless proper preliminary work has been done.

Confidence

But, if you start with a method of swimming which is so simple that it can often be done at the first attempt, then confidence is enhanced and a firm foundation of ability is laid on which more important strokes can soon be built up.



The stroke to aim at in the Dog Paddle

The ideal stroke for the beginner therefore is *dog paddle*. Actually dog paddle can hardly be called a real stroke, it is so elementary and simple, that it has small value either for distance or speed. That doesn't matter however ; its one purpose is to get you swimming, with both feet off the bottom, in the shortest possible time.

The Movements Explained

The movements of dog paddle are easy to understand—the arms work almost exactly like the front paws of a swimming dog, and the legs very much like the hind paws. Each arm in turn is pushed forward to full extension at the front, just under the surface ; then is driven downwards and backwards until it reaches a point at right-angles to the surface.

From here it draws up limply, doubling at the elbow, so that the back of the hand passes under the chin, and the whole arm can glide forward to full stretch once more, in readiness for a new stroke. As one arm drives the other recovers. The legs work rather similarly—while one recovers forward the other drives back.

To recover, the knee bends and draws forward right under the body, with foot trailing limply. Then it drives back, with foot square so that the sole pushes against the water, until the leg is at full stretch behind. Arms and legs work quite independently of each other.

Another way of readily understanding the dog paddle movements is to crawl along the floor on all fours ; providing you raise each arm to shoulder level as you reach it forward you will then be duplicating the action of dog paddle.

Having a clear understanding of what has to be done, and even a little experience of the actions on land, you will now be ready for the stroke in the water.

Most beginners have trouble because it is some time before their movements are strong and accurate enough to keep them afloat. But you have already learned to glide for several yards with feet well up from the bottom, so that you will not be troubled in this fashion.

All you have to do is to push off from the side of the pool, as described last week, and as soon as you are clear and at full stretch, begin the dog paddle movements. The head will have been lifted, and the movements of arms and legs will enable you to continue the impetus of the glide. Perhaps at your first attempt you may even travel several yards.

One thing is of great importance—you must breathe as you swim. A short desperate struggle with your breath held is almost useless. As soon as you are gliding, therefore, begin to blow out through your nose.

Natural Breathing

Thus, by the time the head lifts, supported by the first downward stroke of an arm, your lungs will be conveniently empty and you will be able to open your mouth and gulp in a fresh supply of air. Aim just as much at continuing with natural, even breaths, through the mouth, as at performing the fairly slow, strong movements of the limbs.

Persevere ; interspersing this push and glide method of starting, with more leisurely practice in which you lie conveniently supported by a

motor tyre or some similar float or belt. Such a support will allow you to think clearly about what you are doing, freed from the overwhelming anxiety to keep yourself afloat.

You should not spend much time using any artificial support, but there is real help to be gained if you use such aids with moderation.

Persevere and Push

Persevere especially with the push and glide followed by the unsupported swimming. Set yourself a fixed distance—perhaps five yards at first—and strive over and over again to reach that. Then aim at a couple of yards farther, and so continue until you achieve the distance of the first test—which will appear at the end of next week's article.

As your first real swimming stroke will probably be crawl, or breast-crawl as the proper name should be, then it will be helpful if you begin to study crawl swimmers, so that you gain a preliminary notion of what you will soon be trying yourself.

By this time also you should have an acquaintance with the rules of sound bathing.

Always wait two hours after a meal before going into the water, thus allowing for "digestion time."

Come out of the water while you are in a pleasant glow; never stay on until you are chilly. If you bring a glow ashore it will stay with you afterwards; if you come out chilly you will be none the better for your dip, and most likely will get a headache.

Don't bathe in strange water, except at recognized safe spots. There may be dangerous currents, weeds, cold springs, rocks.

Watch the Tides

In the sea always bathe with an incoming tide. And don't go out from land without keeping the return in mind.

Should you be troubled with fingers that go white and numb, when the water is reasonably warm and you have not stayed in too long, then it is as well to get a doctor's advice. Never pretend to be in danger.

MAKING A BOX KITE

FOR the construction of this box kite provide four strips of wood 5/16in. by ⅜in. and 30ins. long. A planed blind lath cut into strips will do for the wood, but choose one with a straight grain and free from any knots.

For the cells of the kite, strong coloured tissue paper is the material to be chosen. This should be cut into two strips 9ins. wide and 4ft. 8½ins. long. The ends are pasted together to form two bands.

A ½in. of each edge is then pasted and a length of thread or fine twine laid along the pasted edge which is then pressed over to form a hem, enclosing the thread. Each band is then folded into four equal parts, the creases being guides for fixing the long strips of wood.

These are glued to the paper edgewise, and after the paper has been well pressed down, left for awhile.

The cross bars are strips of the blind lath cut 19½ins. long and fastened together in pairs by a fretwork nail through the centre. At the end of each cut a notch 5/16in. by ¼in. and pare the ends to a bevel. The cross strips are then pressed gently between the long strips to stretch them apart and bring the kite to shape. A small notch can be cut into the long strips for the ends of cross strips to set in.

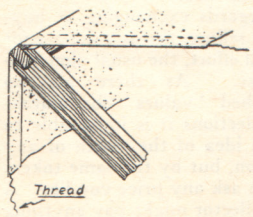


Fig. 2—The threaded edge

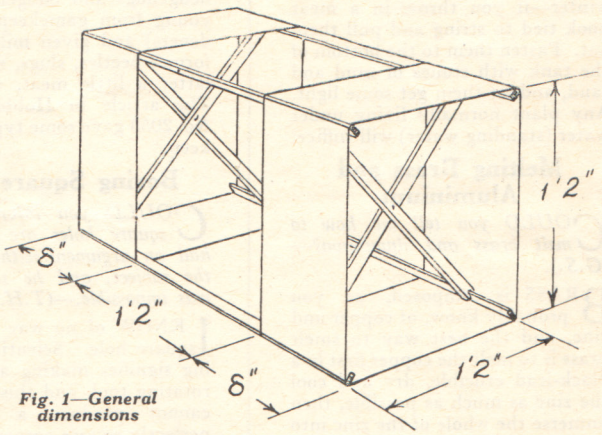


Fig. 1—General dimensions

Fig. 1 shows the main dimensions of the kite and Fig. 2 a detail, showing the thread inserted in the pasted hem and one end of a cross strip showing how it fits across.

It is important not to cut the cross strips too short or they will not fit tightly enough, and be useless. It is best to cut the length rather on the full side and trim the notches up as desired afterwards until the fit is satisfactory. It is easy to cut a piece off as required.

Care should be taken to get the fit right; if too tight, the paper cells may split under the strain, so go easy with the job until satisfactory.

No bridle line is needed for a box kite, the kite line being attached approximately where shown in the general view of the completed kite.

A box kite is not difficult to fly. Let out twenty to thirty yards of line and get a friend to launch the kite in the air for you, a good breeze will do the rest.

Fish Plants for Aquaria

I HAVE seen fish plants growing in aquariums, and from what I can gather, they not only add colour to the surroundings but the fishes themselves obtain a certain amount of oxygen from them.—(F.R.).

"FISH plants" are merely ordinary water weeds usually Elodea canadensis, sometimes the various species of potomagetons, and may be purchased for a few pence from any pet stores. Any pond or stream will provide them in summer—they die down in winter—if you throw in a meat hook tied to string and pull them out. Fasten them to the bottom of the tank with stones or mud and sand, and let them get some light. Any plant normally living under water (standing water) will suffice.

Melting Brass and Aluminium

COULD you tell me how to melt brass and aluminium?—(G.S.).

BRASS is composed, as you probably know, of copper and zinc, and the best way to smelt brass is to melt the copper first in a black-lead crucible, dry and cool the zinc as much as possible, then immerse the whole of the zinc into the copper when the latter is not hotter than to barely remain fluid. Drop a piece of borax the size of a walnut into the pot. When the surface of the metal is covered by a fine charcoal, the smallest loss of zinc is sustained.

Pure aluminium is soluble in sulphuretted hydrogen, but if the articles referred to are very modern, they will possibly contain a great deal of alloy, and a difficulty may be experienced. In recent years aluminium has become so popular in replacing silver articles, that advantage has been taken of this fact, and it is less pure than it used to be.

To Make Charcoal

WILL you kindly let me know of a way to make charcoal?—(M.C.).

FILL an ordinary clay pipe with sawdust and seal the mouth tightly with clay or sealing wax, the former being by far the more satisfactory medium. Now heat the pipe in a flame, and various gases that are in the wood will be driven off. When these are all expelled you should have a pipe full of charcoal.

A Home Zoo

WILL you send me the names of the common animals which I would have in my zoo, and which cannot protect themselves against cats.—(R.L.S.).

COMMON animals to keep in a small home zoo are pet hedgehogs and badgers (obtained young from gamekeepers or gardeners) and given milk sops, the former beetles, slugs, etc. and the latter a little meat, worms, etc. The article in Hobbies Weekly No. 2053 gave some typical pets to keep.

Boring Square Holes

COULD you inform me how square holes are bored, as I had an argument with a man on the subject, and he said that it was impossible.—(T.H.).

I KNOW of no way of boring a square hole. Scientifically boring signifies making a hole by a rotating tool, and this, obviously, cannot produce a hole with perfectly square corners.

It is, however, possible to cut a square hole by various methods, the commonest of which are those used in the chain and the hollow chisel mortising machines.

In the former, the chain works on the principle of a dredger, and cuts a perfectly clean hole with square corners, but which has a hollow finish at the bottom where the chain turns. In the second type a twist bit works inside a hollow square chisel which is made with open sides to allow the waste material to be cleared from the hole.

A Model Launch

PLEASE could you inform me of how to make as cheap as possible a model launch?—(F.S.).

DETAILS for making a small model launch—the "Gadfly"—were given on our Design Sheet No. 191 Special. This is obtainable for 9½d. post free, and the instructions how to build it were given in Hobbies Weekly, dated July 7th, 1934, price 3d. post free.

Smoke Screen Chemicals

COULD you tell me how to make a chemical compound which when ignited emits a dense cloud of smoke?—(F.P.).

ORDINARY camphor is a substance which gives off a dense black smoke, and a good supply of this powdered would suit your purpose better than the small balls of camphor usually used for keeping moths away. You could then use as much as you like and make as much smoke as you like.

Another good medium for producing smoke is ordinary tow. If some short lengths of soft, thick string are soaked for 12 hours in a saturated solution of potassium nitrate, dried thoroughly, then ignited and placed inside a ball of tow, clouds of smoke will emanate.

Matchbox Tops

I AM much interested in matchbox top collecting, and would like to know a few details about this hobby.—(P.P.).

THERE are no established rules governing the collecting of matchbox tops, although there is a considerable private interest in the subject.

Most collectors preserve the cover and the lid of the box, and place them in "guard books," fixing them by gummed paper tabs at the back. This method allows the matchbox tabs to be removed or re-arranged without difficulty. One side of a sheet only is used so that there is one blank page and one page of 'tops' wherever the book is opened.

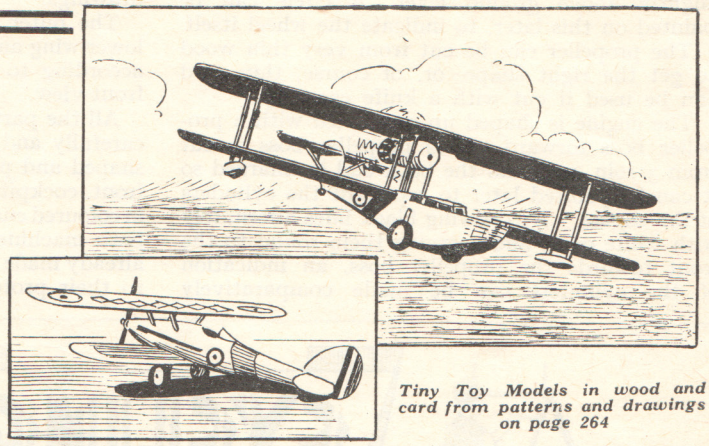
As regards exchanging or buying and selling, this is a matter for personal effort, the usual plan is to advertise. As there are no established 'values' for matchbox collections it is impossible to give an idea of the worth of any collection, but by the same token, you can ask any price you like. A keen collector might pay anything for a rare specimen.

MODEL MINIATURE AEROPLANES

IN our issue of May 23rd we gave patterns and instructions for making a small model of the naval aircraft carrier "Hermes" and promised then to supply details for the making of two little 'planes with which further to make the whole model realistic.

The patterns and particulars for making two such 'planes are given on page 264, and the model maker can complete them quite easily from a few odd pieces of wood with the aid of a penknife, some small fretwork files and glasspaper.

The greatest point, of course, is care and patience, and a realistic finish.



Tiny Toy Models in wood and card from patterns and drawings on page 264

The parts are only quite small because the larger of the two 'planes has a wing span of just under 4ins., whilst the smaller one is but 2ins. across.

The actual types are of the Hawker "Nimrod" which is an adaptation of the well-known Fury single-seat interceptor fighter specially evolved for naval use. It is particularly strong to be useful for catapulting and for landing on the steel deck of an aircraft carrier, and is fitted with the usual wheels for landing.

Machine Types

The larger machine is of the Super Marine type following the Seagull Amphibian, with metal hull and forward and rear gun cockpits. It is of the pusher type of 'plane, and has in addition to the hull which serves as a float, wheels which are naturally retractible if necessary. The type has been adopted by the Fleet Air Arm for general reconnaissance duty.

The pictures here of the two finished models should be studied in conjunction with the actual details and patterns given full size, for it is largely by a study of these that one can get the actual shaping correctly.

In Wood and Card

The models are cut from very small pieces of wood and card. Let us take the "Nimrod" first, details of which are given in the upper portion of page 264.

The fuselage of the 'plane is shaped from a piece of ¼in. circular rod, and the elevation and side view show how it tapers fore and aft. A short vertical slit is made in the tail with the fretsaw, and into this is fitted the rudder. The top of this tail by the slit is slightly flattened, and on to this flat piece the two tail planes are glued close up to the vertical rudder itself. These parts, as well as the wings, are cut from thin card which should be as stiff as possible.

Note, too, the ⅛in. circular cockpit which is drilled, and the small shaped top of wood which is fixed behind this to form the head back for the pilot. Underneath the cockpit a slight slit is taken out to allow the under wing to tilt slightly.

A small block shaped as shown at B is also glued under the fuselage, and on each side of it come the struts for the wheels. The wheels themselves are made from 3/16in. dowel rod. Shape up the end of the rod with files and glasspaper, then cut off very clean and thin the thickness of the wheel itself. Bore a hole carefully through the centre, and drive in a pin, the end of which is turned upwards to be forced into the underside of the fuselage.

Four shortened pins are also required to form the struts for the upper wing. They are driven nearly home, then a blob of glue stuck all round the head on which the wing itself is bedded. If the glue is put on the underside of the head as well as the top, a substantial joint will have been made.

Colours to Paint

The 'plane can be painted a light grey with the circular rings of the Air Force on the wings in red, white and blue. Between these wings are the peculiar diamond pattern and two lines seen in the illustration, and a band is also drawn round where indicated.

The Super Marine patterns are in the lower portion of page 264, and here again, care must be taken to shape all parts correctly before finally gluing them together.

This time the fuselage is taken from ½in. square stripwood and shaped down as shown by the various views. In this the top portion is flat, and a covered-in cabin is formed by a piece shaped from flat 3/16in. wood. It is provided with an angular front and a slight slot to take the wings.

Two gun cockpits are drilled 3/16in. diameter, and the guns themselves made from pins glued

near one end as shown by the view looking down on the 'plane.

The wheels and struts are made and fixed as before. The tail piece is again driven into a slot in the fuselage, and is halved together into the rudder at the slot A. Notice that the peculiar little projection on the tail is intended to represent the wheel, and lifts the tail end of the fuselage slightly above ground level. A circle can be painted on this later, to indicate the wheel itself.

The propeller can be cut from very thin wood to get the right shape, or, of course, thin card can be used if cut with a knife carefully.

The engine is shaped up and fitted with a propeller boss forward. This propeller boss is cut from 3/16in. rod, and the back end is enlarged so it can be painted later to represent the cylinders of the engine. By drawing black lines alternately with white ones, and carrying them round to the front towards the propeller boss, an indication of the cylinders can be made comparatively realistically. The propeller, of course, is fixed by driving a pin in through the centre carefully.

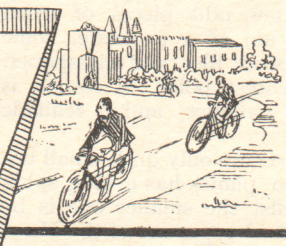
The wings can be held apart by metal pins, or very thin strips of wood. If pins are used they are driven into the top of the fuselage which is wide enough to take the engine, and the top wing plane is glued above as before. Measurements can be obtained from the full size patterns and drawings.

The outer wing struts pass right through the lower wing and fix into the floats which are shaped according to the details shown by the side and front view.

All the parts, of course, should be handled very carefully and much depends on the way they are shaped and painted. The usual wing slots, cabin front, cockpit edging, float lines, etc. can be added in coloured enamel or flat paint, and when completed both machines are, as we know from the models already made and tested, quite realistic and correct to their prototype.

CYCLING

ITEMS OF INTEREST



Concerning Saddles

HOW many cyclists give due attention to the saddle of their machines? Not many—yet there is as great a difference between a good and a bad saddle as between (say) a good tyre and a bad one. Not only does a good saddle increase riding comfort, but it retains its shape and resilience long after an inferior one has become a frequent cause of saddle soreness.

The life of a saddle depends a great deal on how it is cared for, however. After the first few score miles of riding, a new saddle will have stretched slightly. It should be tightened by means of the screw underneath or protruding at the front.

At the same time, the under surface of the leather may be treated with a little leather oil, to keep it supple and repel damp. There is nothing more detrimental to a saddle than allowing it to stand unprotected in rain. Covers of cloth are cheap; even a newspaper or magazine used as a protection when the bicycle has to be left standing in the wet is preferable to nothing.

Cutting Cables.

A broken brake cable is not necessarily useless, for if it has fractured close to the nipple a repair can usually be effected. The outer covering must be unwound and cut off, so that sufficient inner cable is revealed. Then a new nipple can be soldered on.

Even when the fracture occurs about midway along the cable, an entire new cable is not always essential. The outer covering may be in good condition, and it will be economical to fit only a new inner, sliding one. Inner cables can be bought separately for this purpose.

It will probably need cutting to the exact length, and this is an operation in which many handymen go astray. Attempts to clip the cable with pliers will inevitably result in a poor job, for this method will produce a jagged end. These cables are made up of several thin strands, and cutting by ordinary methods causes fraying.

The way to proceed is first to tin an inch of cable on each side of the point where the cut is wanted, by applying solder. Then the cable can be severed neatly by placing it on a hard surface, and cutting it with a chisel and mallet.

Buying a Machine.

New or second-hand? All-black or chromium plated? Light-weight or roadster?

These, of course, are questions to be answered by every prospective purchaser of a bicycle, but there are other points which, though less obvious, are nevertheless to be noted.

It is always wise to go to a recognised cycle dealer, and, indeed, you can pursue this policy even further, by going to the agent appointed to sell the particular make of machine you prefer. Although any recognised dealer can obtain for you a bicycle of any make, the appointed agent is the one likely to have the biggest selection, and he will carry the largest stock of spares.

If you obtain a bicycle by the hire-purchase system, remember that in law the instalments are regarded as only covering the *hire* of the machine, until the whole sum has been paid.

Thus, if an instalment is not paid until it becomes due, the dealer has the right to reclaim the machine, without giving any consideration for the instalments previously paid.

Files for Edge Decoration

IN our last page of notes I dealt with the question of using designs formed by gouge cuts as a means of decorating articles made in the handicraft centre. Another style of decoration, which is within the capabilities of even junior boys, is that of shaping the edges with a file either flat, triangular, or half-round. This work will provide some very attractive results and is full of possibilities for anyone with a little originality.

How the Work is Done

IN Fig. 1 will be seen the sections of four files with the use of which innumerable designs can be executed. While it is not absolutely necessary to have all these, it will, especially when working with younger boys, be an advantage to have a file of approximately the same shape as the design being cut.

Fig. 1—Four useful file shapes

Fig. 2 shows a few very simple combinations of shapes, just to give a little idea of how the various shaped "cuts" can be used, but they by no means exhaust the possibilities of this method of decoration and, once the idea has been explained to the class, each boy should be encouraged to think out some suitable original design for the article he is making. The relative proportion of the various units making up the design is very important and this point should be stressed when explaining the work.

Uses for the Design

THE articles to be decorated by the method just described will, of course, vary with the syllabus work of each individual centre. In most courses, however, one comes across a stool, a mirror frame or a candlestick of some type or other and, on this page, an example at Fig. 3 is given in which some part of the article is decorated, using one of the suggestions in Fig. 2.

Stool and table tops and rails, backs of articles of the rack or bracket type, shelf edges, and tray sides are a few examples of other places where this type of decoration could also be used to advantage.

The Use of Paint

OPINION is divided as to whether paint should be used as a finish for articles made in the handicraft centre. Generally speaking, the question of "fitness for purpose" is a fairly safe guide regarding this point. For example, a painted finish would be quite suitable for articles constructed for outdoor use, for use in a bathroom where steam would ruin a polished surface or, in some cases, for kitchen equipment.

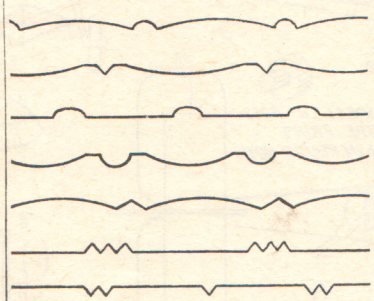


Fig. 2—Decoration shapes cut with the files shown

It is not, usually, a suitable finish in other instances except perhaps, very occasionally, when an article is required to form a unit in a colour scheme.

A Useful Tool

WHEN boys first use a bevel they frequently experience a certain amount of difficulty in setting it accurately. 45° is the angle which is most commonly used and if a few "fixed" bevels are made for this angle they will well repay the time spent in making them. If the scheme contains models in which other angles are frequently required it may be worth while making "fixed" bevels for these angles also, but this will be a matter for each individual teacher to decide for himself.

How to Make it

A "FIXED" bevel, as its name implies, is one in which the blade is fixed in the stock instead of being adjustable. The blade may be made of any thin hardwood, 3-ply or, better still, a piece of thin steel such as an old saw blade.

The stock can be made of one piece of hardwood or it may be built up of two or three thinner pieces. If a wooden blade is used it should be slotted into the stock and then glued and screwed with two screws. With a metal blade only the screws can be used for fixing and the angle, in this case, must be adjusted by filing the edges of the blade.

Limed Oak Finish

A LIMED finish for small oak articles is very effective and is quite simple to execute. Briefly, it is done as follows. Mix unslaked lime with water in the proportion of about 1 lb. of lime to 3 pints of water stirring until it has cooled off and has the consistency of cream.

Apply this liberally and rub it well into the pores with a circular movement. Wipe off all the superfluous lime with a pad and allow the work to dry thoroughly, then give a coat of white polish and, when this is dry, rub down very lightly with fine glasspaper. Give final polish with white polish or wax.

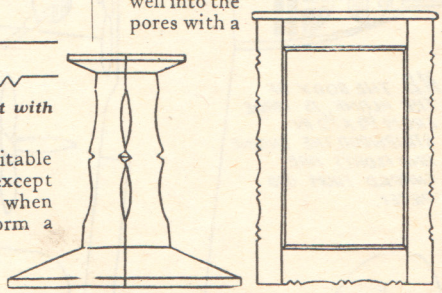
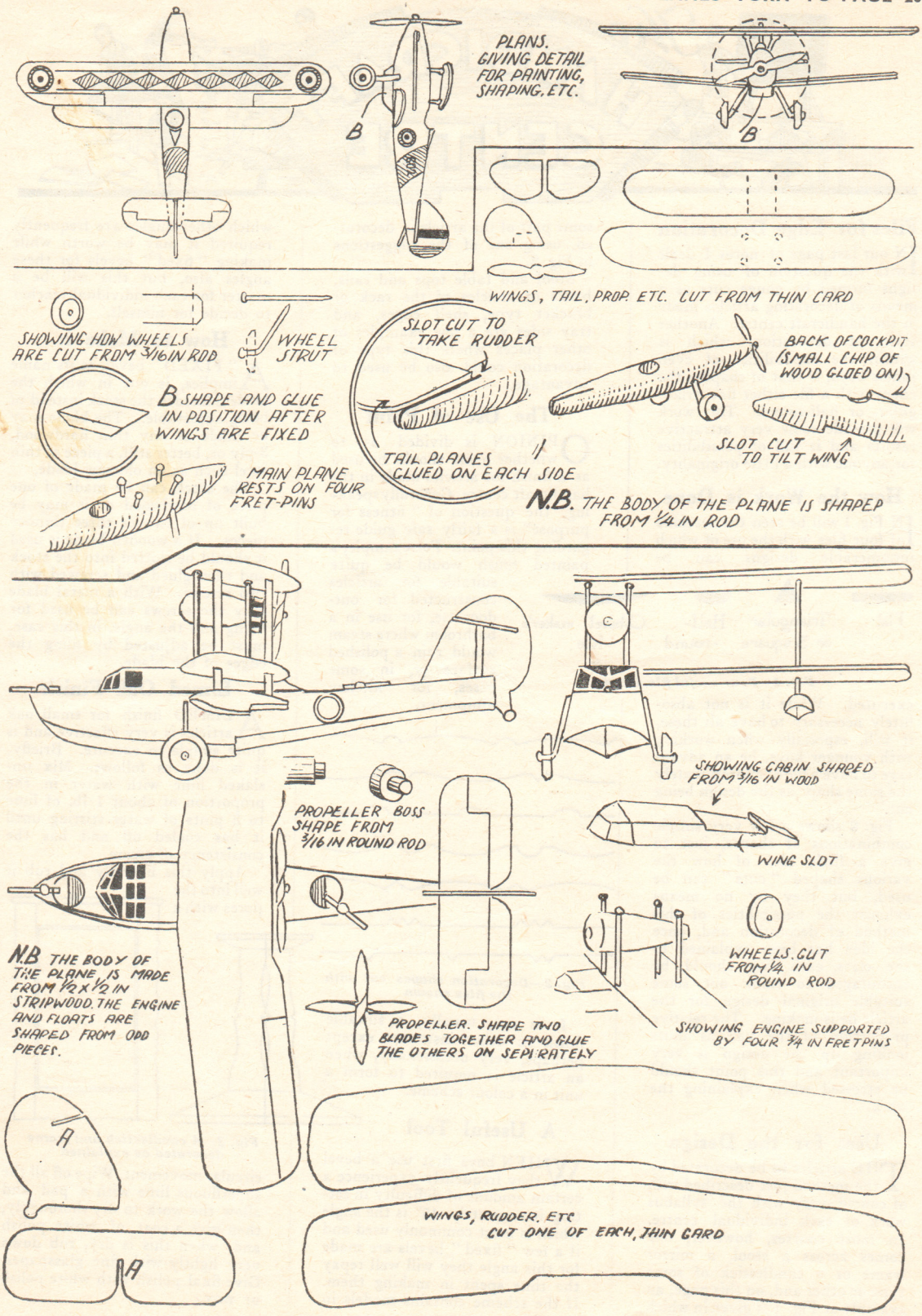


Fig. 3—A candlestick and frame decorated as explained

FOR INSTRUCTIONS ON MAKING THE PATTERNS OF THESE AIRPLANES TURN TO PAGE 261

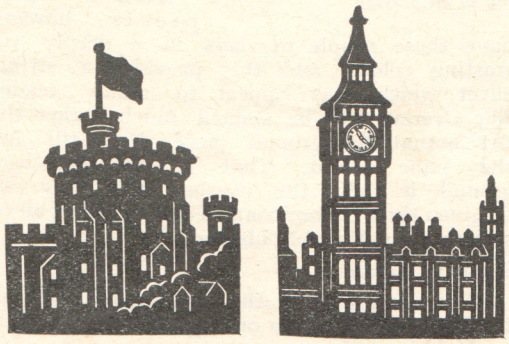

PLANS. GIVING DETAIL FOR PAINTING, SHAPING, ETC.
B
B
WINGS, TAIL, PROP. ETC. CUT FROM THIN CARD
SHOWING HOW WHEELS ARE CUT FROM 3/16 IN ROD
WHEEL STRUT
B SHAPE AND GLUE IN POSITION AFTER WINGS ARE FIXED
MAIN PLANE RESTS ON FOUR FRET-PINS
SLOT CUT TO TAKE RUDDER
TAIL PLANES GLUED ON EACH SIDE
BACK OF COCKPIT (SMALL CHIP OF WOOD GLUED ON)
SLOT CUT TO TILT WING
N.B. THE BODY OF THE PLANE IS SHAPED FROM 1/4 IN ROD
SHOWING CABIN SHAPED FROM 3/16 IN WOOD
WING SLOT
PROPELLER BOSS SHAPE FROM 3/16 IN ROUND ROD
N.B THE BODY OF THE PLANE IS MADE FROM 1/2 x 1/2 IN STRIPWOOD. THE ENGINE AND FLOATS ARE SHAPED FROM ODD PIECES.
WHEELS. CUT FROM 1/4 IN ROUND ROD
PROPELLER. SHAPE TWO BLADES TOGETHER AND GLUE THE OTHERS ON SEPARATELY
SHOWING ENGINE SUPPORTED BY FOUR 3/4 IN FRETPINS
A
A
WINGS, RUDDER, ETC CUT ONE OF EACH, THIN CARD

THE USE OF FRETTED OVERLAYS

IT does not seem to occur to readers so much as it might, that the weekly designs published in Hobbies and those shown in the current Handbook, have a number of uses beside making up the actual model or article for which they are intended. One of the outstanding uses is that very often the overlays provide excellent decoration for other furniture or pieces of work.

A glance through the Handbook with this in mind will no doubt provide some immediate ideas, but a few suggestions here will be helpful. The overlays of the designs are provided in all shapes, sizes and styles, so if you are building a plain piece of furniture—say a cabinet—there is sure to be an overlay which is suitable for the style you have in hand.

We illustrate herewith some of those simple



Two National Buildings as suggested overlays

patterns which can be used. These are of the decorative type only, but there are also a number of other feature pieces which can be incorporated on various suitable pieces of work.

For instance, on Design No. 1662 we have three overlays representative of England, Ireland and Scotland. These overlays are illustrated herewith as the rose, the harp and lion rampant. The patterns themselves provide for overlays about 3½ins. high and 2½ins. wide, which is just the right size for addition to a door or a little plain bracket.

Suggested Uses

All these are also suitable for a simple addition to a wardrobe door, the front of a wireless cabinet or even on the front of a modern chest of drawers if the decoration is kept simple.

In addition to this type we have a number of other overlays which suggest themselves as suitable. On the Jubilee Plaque of Design No. 2063 there is a silhouette cut very clearly in fretwork of Windsor Castle and the Houses of Parliament, both of which should be borne in mind in view of the Coronation next year.

Or, of course, you could have the dog designs from No. 1432. These actually are shown as the top of brackets, but there is no reason why they should not be cut out separately from odd pieces of wood and made to stand by themselves as little cut-out statuettes. Indeed, if they are cut in fairly thick wood they can be shaped up and rounded off quite realistically if carefully done with a penknife and finished off with glasspaper. Ships and birds also provide a number of opportunities.

There is the quaint old owl from No. 1993, the little girl from No. 1309, the peacock from No. 2046 the stag from No. 1650 and so on.

How to Cut

In cutting these overlays, remember to take them out from thin wood unless you are having it on a large piece of furniture such as a wardrobe. Even in that case it should not be more than 3/16in. thick, but in the ordinary way an overlay of 1/16in. is sufficient.

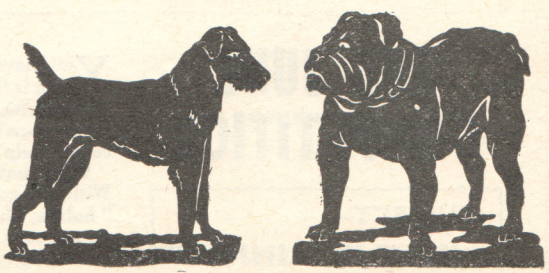
Cut them in plywood to reduce the likelihood of breakage, and of course, add another thicker piece behind the plywood to strengthen it during the cutting operation. Use a fine grade fretsaw (No. 00) and hold the wood firmly down to the table with the fingers as close to the sawblade as possible.

Get the cutting clean and correct because with such thin material it is awkward to shape it up with a file if any errors occur.

Cleaning and Gluing

The overlays will need a light rubbing on the back to clear off any saw burr, and should then be laid in place where they are going to be fixed, and a light pencil mark made on the wood here and there. This is so the overlay can be laid on when it is glued, without having to move it about and so push the glue out from the edges.

In adding the glue, see that only a thin film



The dogs are always popular subjects

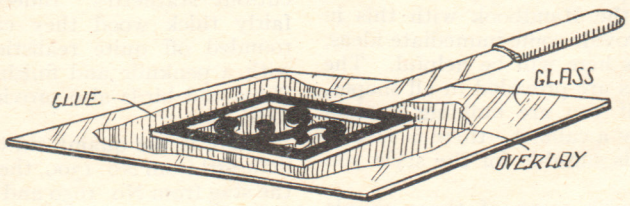
is put on, because if it is laid on thickly it will squeeze out and look unsightly, as well as be difficult to wipe away.

One of the troubles with a lot of workers is that they are in too much hurry when they have applied the glue to the wood to put it in place. Actually it is best for the glue to get tacky, and there is really no rush to fix the parts together.

A Gluing Tip

A good plan for such work as this is to have the glue fairly fluid and to rub it on the work with the tip of the finger. Remember, it is not so much the amount of glue which is applied, as the way in which it is rubbed into the wood to hold the grain securely to the part to which it is added. See therefore, that the finger tip rubs an even coat of glue over the whole of the back before applying it to its position.

Another good plan is to put a coating of glue over a piece of stout glass after having made sure it is quite clean. Then lay the overlay down in position, and press the part gently on the glue to transfer it from the glass to the wood. Take a piece of flat strip steel—a pliable large table knife will do nicely—and slide it carefully under the overlay between the glue and the glass, cutting it away and taking care no breakage occurs.



How to apply glue evenly to an overlay

The overlay will then have the glue over the whole of its surface, and it can be transferred to the position where it is going to be fixed.

In Metal or Composition

Another suggestion which will probably appeal with regard to these overlays for other jobs, is to cut them out in composition or even in metal. Ivorine and xylonite are two suitable materials supplied by Hobbies Ltd.

The former has a white glossy surface, and the latter a black glossy surface. Both are simple to cut with the fretsaw, and can be fixed either by small nails and screws, or by roughing up the back surface with a file or glasspaper to make the glue hold

If metal is used, the sheet must be put between two thin pieces of wood, and the pattern pasted on top. Holes must be drilled through the metal and long fret pins driven in and bent underneath the bottom layer of wood to keep all the parts together during the cutting process. There are, of course, special metal cutting saws for this purpose, and although the operation takes longer, the result is certainly very appealing.

We would not, however, recommend a large overlay being used for this purpose, nor anything thicker than is consistent with a fairly stiff sheet. Brass, of course, is soft enough to cut comparatively easily, while others may like to try zinc or copper. We have even seen overlays cut in slate, and those who can obtain the thin slabs from quarries may like to try their hand at this novel effect.

The overlays can be treated as part of the work so far as the finish is concerned, and can be polished over in the usual way providing it is carefully done. Naturally, the polish is applied with a brush in order to get into the corners and quirks.

Some modern pieces, however, have these simple overlays in a deeply contrasting colour, and this provides a striking effect which may appeal to many readers. The overlay can be stained much darker than the actual background piece, but still kept the same colour. That is, if the background is oak, the overlay can very well be given three or four coats of stain to get it an oak stain but considerably blacker.

Finish in Colour

If you care to have the whole thing black, use the Ebonising Solution or Eggshell Black supplied by Hobbies Ltd.

On the other hand, if you like striking colour, there is a very wide range of Crusoe enamels which are obtainable at 2d. a tin and very easy to apply. These enamels, by the way, as well as the Ebonising Solution etc., should be put on the overlay before it is fixed to the actual work, because it is always impossible to paint it on in place without the brush overlapping on to the work itself.

OUR JUNE COMPETITION

SUBJECT—
"ISN'T IT FUNNY!"

YOU have all seen the type of snap that makes people smile. Maybe it is the cat stealing the milk, or a pet dog dressed up, or someone with their feet too near the camera and so wearing "giant" boots Or perhaps it is just a group of people grinning so cheerfully that yon cannot help joining in.

Well, that is the sort of picture we want you to take this month. With the good light of June and with everybody beginning to feel "holidayish" you will be able to turn out some very good efforts we are sure. The best pictures submitted will win a prize if sent in according to the simple rules which will be given next week.

"In an ideal state of society"
Quoth a Parson renowned for his piety,
"We'd have friendship alone, and the only guns known
Would be those of the 'FLUXITE' variety."

See that FLUXITE is always by you—in the house—garage — workshop — wherever speedy soldering is needed. Used for 30 years in Government Works and by leading Engineers and Manufacturers
OF ALL IRONMONGERS—IN TINS
4d., 8d., 1/4 and 2/8

Ask to see the FLUXITE SMALL SPACE SOLDERING SET—compact but substantial—complete with full instructions—7/6
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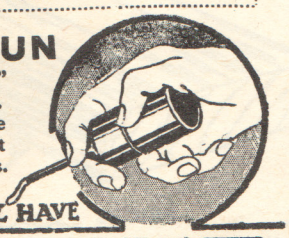

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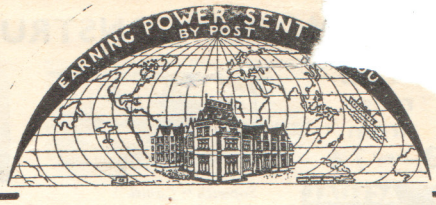

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...ices range from 3/- to 7/6

1/24TH ACTUAL SIZE

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You can buy it from any Hobbies Branch or Agent, or direct by post from Hobbies Ltd., Dereham. See note at right.

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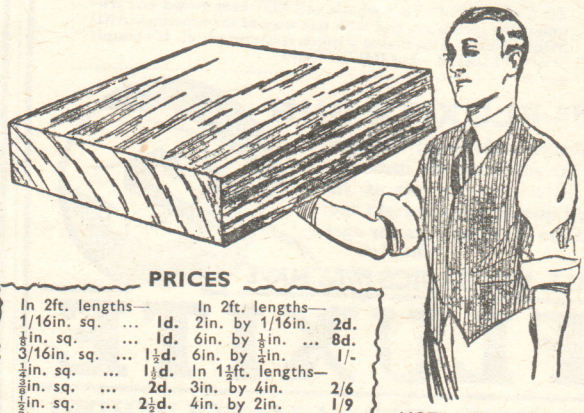

PRICES

In 2ft. lengths—		In 2ft. lengths—	
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1/2in. sq.	2½d.	4in. by 2in.	1/9
3/4in. sq.	3d.	In 1ft. lengths—	
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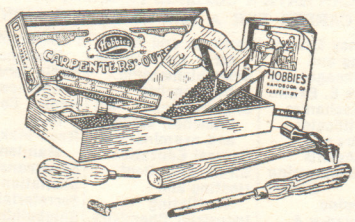
6in. by 1/16in.	6d.	2in. by 1in.	6d.
3in. by 1/16in.	3d.	3in. by 4in.	1/9

NOTE.—There is a minimum charge of 6d. to cover postage and packing. Please include this amount if you order by post.



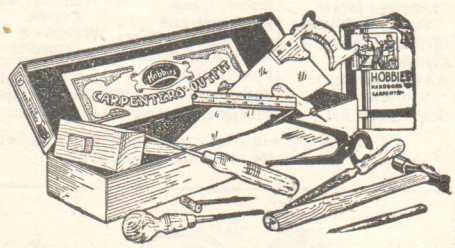
The No. 1 Carpentry Outfit contains eight tools with an instruction handbook. An ideal set for the young beginner. Price 8/- post 7d.

CARPENTRY SETS

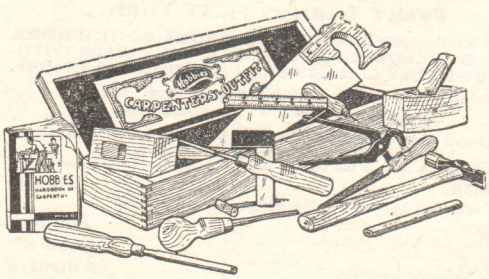
Be wary of the carpentry set with a lot of tools offered at a low price. There's a catch in it somewhere, and somebody is going to be disappointed.

You can trust Hobbies carpentry outfits. Each one contains a selection of tools which you can use—REAL tools. Whichever set you choose from the Hobbies range you may be sure that you are buying good value in good tools.

Don't judge value by price alone. It's what you get for what you pay that counts.



The No. 2 Carpentry Outfit. A popular outfit at a popular price: Eleven tools of clever design and built to last. The handsaw is 16ins. Price 13/6, post 10d.



No. 3. Carpentry Outfit. An 18in. Handsaw, smoothing plane with double iron, chisel, gouge and nine other tools make up this practical kit of tools. A 64-page handbook of things to make is also included. In attractive wooden box 27/6, postage 1/-.

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WATERBATH DEVELOPMENT

A COMMON fault in negatives made through small lenses is "harshness." In the finished picture this results in a lack of half-tones, light areas being too white and shadows too black. The cause in many cases is slight under-exposure. Also negatives at any time made through a small aperture tend to under brightness.

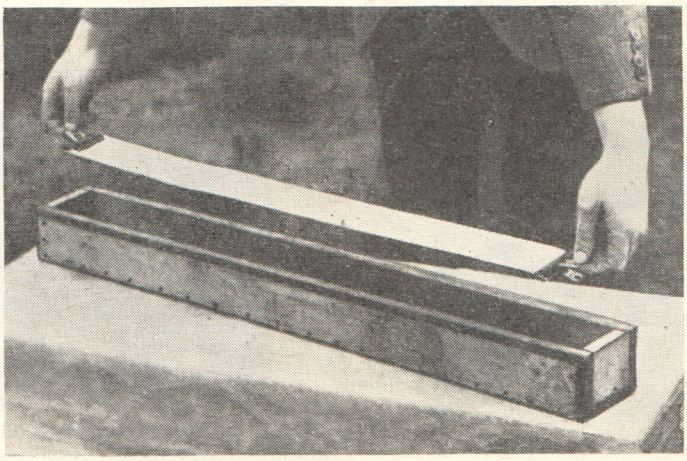
The actual making of the harshness is effected in the development. The shadow details are slow in coming up, not having received adequate exposure. Then before they have come to anything like printable density, the high-lights are over-developed and clogged. Thus half-tones are lost at both ends of the scale.

It is obvious, however, that it is possible to develop in such a way that the shadow details receive just a little more development, while the highlights just a little less a balancing out effect would take place; the half-tones being improved in the shadows and retained in the high-lights.

The System

The waterbath system we are describing this week effects this balancing out to a great extent, and is the ideal development for roll-films exposed through small lens apertures. It is also useful at all times for known contrasty subjects when an evening up of tones will be advantageous.

Some photographers use the waterbath at all times, as the soft, even negative, full of detail is greatly sought after. This kind of negative makes a picture showing all the delicate half-tones of the subject and if printed on suitable paper will be in no way flat. In fact the final brilliance of an even negative is far more controllable than with a harsh negative. Here, if one prints for the shadows, the high-lights are empty areas of white, and when printing for the high-lights it gives solid black shadows. The even negative is ideal also for enlarging.



How the film is clipped and put in the waterbath

Now, with regard to the waterbath system of development broadly it is this:—As well as the hypo and developing dishes on the bench there must be a receptacle for clean water (other than the bucket below). In the case of plates this is merely another dish. The method of dealing with films is described later.

Development Starts

The film is softened in the bucket in the usual way and is run through the developer for about 20 to 30 seconds only. It is then quietly stretched out in the clean water and left for not less than 2 minutes. Again it is run through the developer, this time for 40 seconds and then put in the water again for not less than two minutes. This continues, adding about 20 seconds to the time in the developer at each immersion till the development is complete.

This, of course, is judged, as before, by seeing the image coming well through to the back of the film.

A film or a plate so developed will show decidedly more development in the shadows and less in the high-lights and generally be better balanced. The reason is not far to seek.

Upon being immersed in developer the emulsion soaks up a little of the solution; when placed in the water that in the high-lights is used up almost immediately and action stops but that in the shadows is not so quickly exhausted and works for a longer time. Thus for the two minutes that the film is in the water, the high-lights have only been gaining density for say 30 seconds or so (action then ceasing). But the shadow detail has had the full two minutes of building up.

Shadow Development

Hence, in the whole process the shadows get really a much longer development than the high-lights which is, of course, what they require.

Compare this with straight development when all parts get the same time in the solution and the balancing-out effect is obvious.

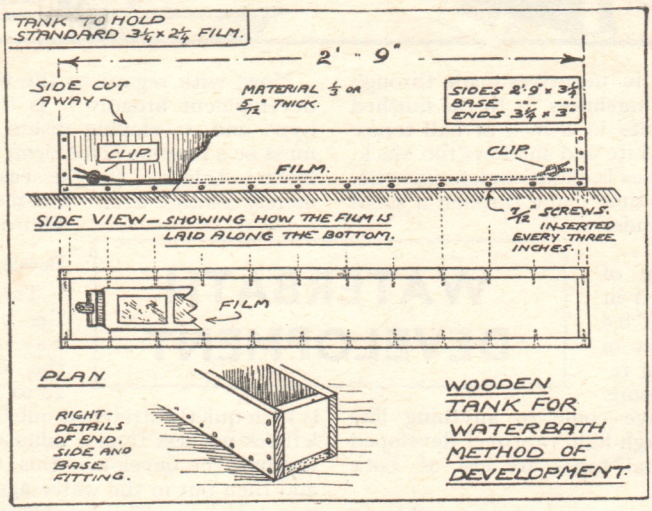
Now with regard to details. There is little difficulty experienced in "waterbathing" plates as all that is required is an extra dish. With films it is somewhat harder to carry out as the gelatine must be flat in the water —not rolled up or even hanging.

The Tank

It is therefore best to build the simple tank shown by the photograph and designed for the purpose. Until this is ready, however, "waterbathing" can be carried out in any large receptacle where the film can be laid out flat, but the wooden tank is far more convenient and does not take very long to make.

The dimensions given are for a tank to hold standard 3¼ by 2¼ ins. roll film, but a smaller tank could be made for V.P. size, etc.

Five pieces of wood (⅜in. thick) are used in the construction, three of these (two sides and the base) being 2ft. 9ins. by 3¼ins., while the ends are 3¼ins. by 3ins. The pieces are joined together by small diameter screws placed at intervals down the length and at the ends, drilling first to prevent splitting. After fitting together, putty is pressed into the screws on the inside to make the tank perfectly water tight and the inside is finished with an enamel paint.



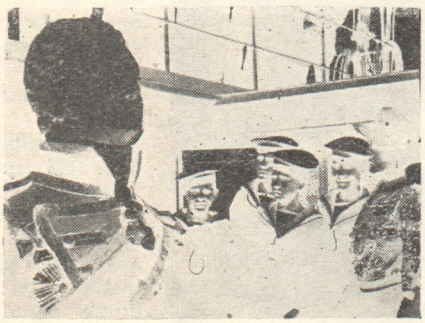
With regard to holding the film stretched out, two bull-dog clips are used. These are put on the ends of the film at the very start and do not leave it till development is complete. The film lies flat along the bottom of the tank, no damage being possible if the bottom is smoothly painted. The clips prevent rolling up.

In the case of both plates and films they should be placed as quietly as possible in the water so as not to rinse the developer away. To this end the depth of water should not be more than is really necessary to cover. A greater depth is allowed in the wooden tank as it is very difficult to keep anything as long as this quite level and if there was too little depth, it would be very easy for the water to run to one end leaving the other dry, with disastrous result to film.

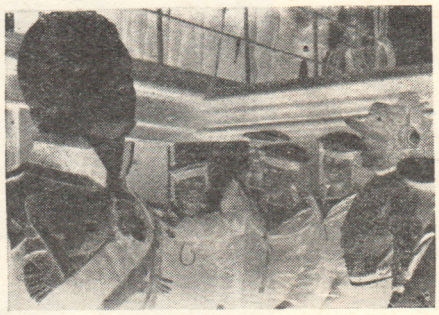
One Final Word

Do not look at the film near the red light too often. Greater care is necessary even than when carrying out normal development for it must be borne in mind that a film is kept about in its sensitive state for a much longer time. Also the purpose of waterbath development is to reduce every bit of light-struck silver in a way that ordinary development does not attempt. Hence there is a greater danger of general fog appearing.

However, if these simple precautions are taken there is no reason why you should not become very expert at the system with great improvement to your pictures.



Avoid this type of harsh negative



A good negative has detail everywhere

Full particulars of our Photographic Competition for June will be found on page 266. Read them now!

MISCELLANEOUS ADVERTISEMENTS

To sell anything except fretwork goods or those shown in Hobbies Handbook. The advertisements are inserted at the rate of 2d. per word prepaid. Name and address are counted, but initials or groups, such as E.P.S. or £1/11/6 are accepted as one word. Postal Orders and Stamps must accompany the order. They will be inserted in the earliest issue.

TRAY HANDLES from 3d. pair.—Hobbies, Ltd., Dereham.

FRETSAW HANDFRAMES from 1/-. Hobbies own make.—Hobbies, Ltd., Dereham.

THOUSAND stamps free (including Jubilees). Request approvals.—Lovelocks, 43 Rectory Road, S.W.6.

CONVERT YOUR TREADLE FRETSAW into a modern motor-driven machine. Full details from Hobbies, Ltd., Dereham.

6/- IN THE £ COMMISSION. Xmas Club Agent Wanted.—Garratt, Stockley Street, Northampton.

FILES FOR WOODWORK. A set of three costs only 2/3, post 4d.—From Hobbies, Ltd., Dereham.

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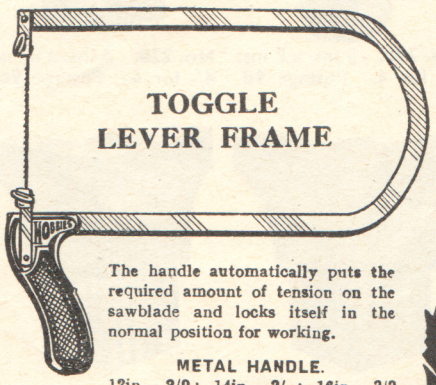
GOOD TOOLS for GOOD WORK



TOGGLE LEVER FRAME

The handle automatically puts the required amount of tension on the sawblade and locks itself in the normal position for working.

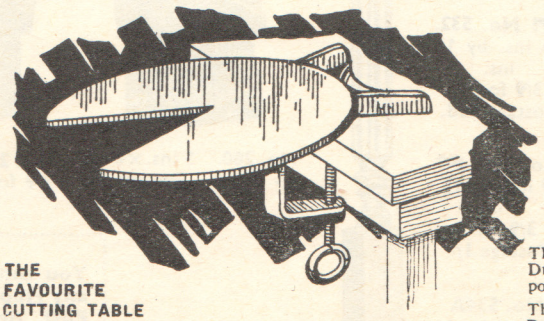
METAL HANDLE.
12in., 2/9; 14in., 3/-; 16in., 3/3

BAKELITE HANDLE.
12in., 4/-; 14in., 4/3; 16in., 4/6

Postage 6d. extra on each.

Good Tools pay dividends in good work well done.

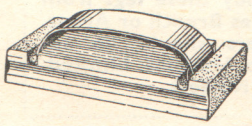
A specialist, whether in medicine or tools, naturally knows more about his own particular line of business than the fellow who has a little knowledge of many subjects. Hobbies specialise in fretwork tools. The tools on this page are typical examples of Hobbies leadership and value. Are they in your tool-kit ?



SANDPAPER BLOCK.

The handle keeps the glass-paper strip taut. Price 3in., 4d.; 5in., 9d.

Post extra.



THE FAVOURITE CUTTING TABLE

A strong, rigid table with just the right opening for average fret-cutting. The steel cramp is detachable from the table.

Price 2/6; post 6d.

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Branches and agents in principal towns.

DRILLS

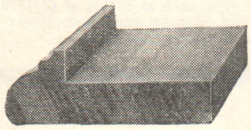
The "Boy's" Drill, with two points. Price 8d.

The "Simplex" Drill is longer, and has four points. Price 1/3

Postage 2d. on either.

CABINET MOULDINGS

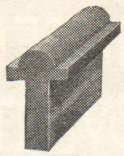
Beautifully finished mouldings in Hazel Pine.



No. **306.** This section has a rebate to take $\frac{3}{16}$ in. wood and may be used as a base or lid moulding. Size $1\frac{1}{2}$in. by $\frac{1}{2}$in. Price **2½d.** per ft. ; **2/-** per dozen ft. ; **16/3** per 100 ft.

No. **307.** Can be used for fillers or as a decorative moulding. Size $\frac{1}{4}$in. by $\frac{1}{2}$in. Price **1d.** per ft. ; **9d.** per dozen ft. ; **5/9** per 200 ft.

No. **308.** Useful on almost any woodwork job. Size $\frac{3}{4}$in. by $\frac{3}{8}$in. Price **1d.** per ft. ; **10d.** per dozen ft. ; **6/3** per 100 ft.



No. **309.** Fit this moulding to cabinet doors to exclude dust. Size $\frac{3}{8}$in. by $\frac{7}{16}$in. overall. Price **1½d.** per ft. **1/3** per dozen ft. ; **9/-** per 100 ft.

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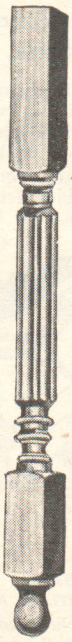
Write to-day, or call at any Hobbies Branch for a complete list of legs. You're almost certain to find the leg you want at the price you want to pay.

SHAPELY REEDED LEGS

Instead of the usual "twist" there is a "reeded" or fluted design which gives a big touch of distinction. See note re Grooving above.



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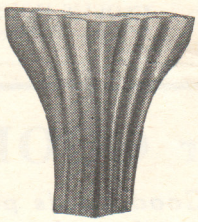

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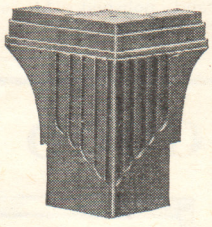

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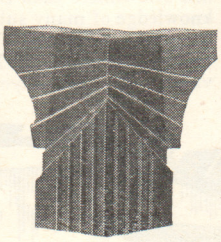

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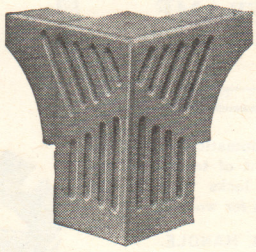

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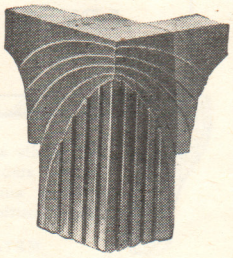

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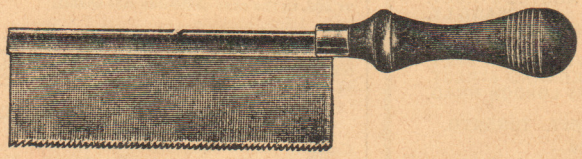

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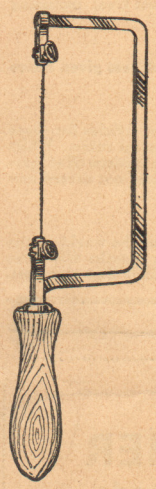

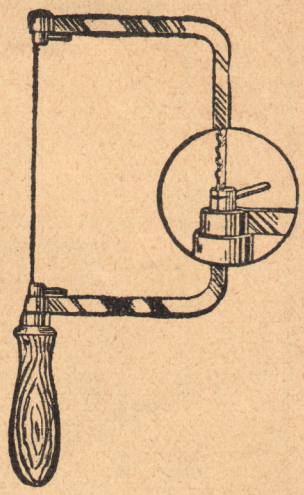

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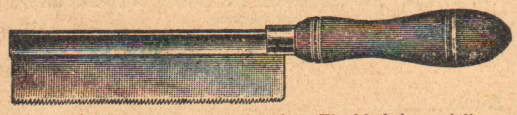

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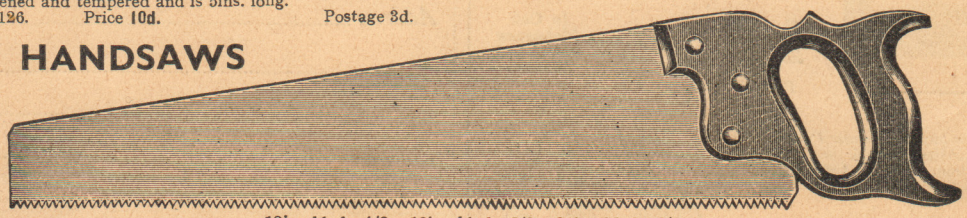

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